

PTO 07-6240

CC=DE DATE=19940210 KIND=A1  
PN=4226010

METHOD AND DEVICE FOR MONITORING THE SERVICE LIFE OF VEHICLE  
COMPONENTS  
[VERFAHREN UND VORRICHTUNG ZUM ÜBERWACHEN DER LEBENSDAUER VON  
FAHRZEUGBAUTEILEN]

WERNER HASENMAIER, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C. August 2007

Translated by: FLS, Inc.

PUBLICATION COUNTRY	(10): DE
DOCUMENT NUMBER	(11): 4226010
DOCUMENT KIND	(12): A1
PUBLICATION DATE	(43): 19940210
APPLICATION NUMBER	(21): P 42 26 010.8
APPLICATION DATE	(22): 19920806
INTERNATIONAL CLASSIFICATION	(51): G01D 1/04; G01L 1/22; G01D 1/18; G01M 19/00; B60G 7/00; B60G 25/00; B60R 27/00; G01M 7/00; G01M 13/00; G07C 5/08
PRIORITY COUNTRY	(33): NA
PRIORITY NUMBER	(31): NA
PRIORITY DATE	(32): NA
INVENTOR	(72): HASENMAIER, WERNER; SCHNELL, RALF; SCHERZER, MICHAEL
APPLICANT	(73): F. Porsche AG
TITLE	(54): METHOD AND DEVICE FOR MONITORING THE SERVICE LIFE OF VEHICLE COMPONENTS
FOREIGN TITLE	[54A]: VERFAHREN UND VORRICHTUNG ZUM ÜBERWACHEN DER LEBENSDAUER VON FAHRZEUGBAUTEILEN

The invention concerns a method and a device for monitoring the service life of vehicle components according to the preamble of Claim 1.

A device for determining a suspension bearing load is known from DE 36 17 426 C1, the measured values determined being reported to the vehicle driver via a display, with which an impermissible bearing load is changed.

The object of the invention is to create a method and a device for monitoring the service life of vehicle components in order to make sure that a prescribed operating safety limit of these components is not exceeded.

This object is achieved according to the invention by means of the characterizing features of Claim 1. The subclaims contain further advantageous features.

The advantages primarily obtained with the invention consist in the fact that the vehicle components are designed with the method so that, for example, they are made lighter and with less rigidity in the case of the same collective load. The components are not made with the maximum design for the heaviest loading situations; the method is used to determine and display if the loading capacity has been exceeded, respectively already achieved.

Currently, for example, chassis components are designed with endurance strength, that is, corresponding to a collective load that

---

\*Numbers in the margin indicate pagination in the foreign text.

corresponds to 300,000 km of a 1% driver. This is the one out of one hundred drivers who stresses his vehicle the most. For all other drivers the components of the vehicle are over-dimensioned, which has the consequence that most components are too heavy.

According to the method of the present invention, it is no longer necessary to design for the 1% driver, but the components are designed for the other drivers.

In order to avoid component failures in the case of the 1% driver, the collective load of each vehicle is sensed on one or more chassis components and, if a predetermined operating safety limit is exceeded, the driver is informed that a corresponding component, respectively corresponding components or component groups are to be replaced.

According to the method, for example, vehicle misuse and accident-like events can be recognized and reported in this way. By knowing the highest loading according to the method it is possible to determine which chassis parts have to be replaced because of impermissible overloading.

Guarantee cases with respect to chassis parts can be unambiguously clarified by this report. The vehicle owner also can be informed about the safety of his vehicle, respectively the individual vehicle components, at any time.

In order to carry out the method the relevant components of the vehicle in highly stressed areas are provided with electric load sensors that, for example, may consist of strain gauges. Other known

load sensors also may be used. The measured values obtained during the entire driving time of the motor vehicle are transmitted to and stored in an evaluation unit, such as, for example, a central processor. Continuous evaluation of the measured values to be summed over time is performed in this unit, so that the maximum loading capacity of the components can be determined and a warning can be displayed.

In the case of the method for monitoring the service life of vehicle components, the load sensors are mounted in highly stressed areas. The measured values or signals obtained during the travel of the motor vehicle are transmitted to an on-board evaluation unit, such as, for example, a processor. Storage and continuous evaluation or adjustment of the summed measured values with the values of the maximum loading of the component takes place in this processor. When this maximum loading capacity is reached, there is a corresponding acoustic or other warning signal that is intended to inform the driver that the component is to be replaced.

## Patent Claims

1. A method for monitoring the service life of vehicle components, in particular chassis components, in motor vehicles via measuring elements, wherein the components in highly stressed areas have electric load sensors, the measured values obtained from which during the entire driving operation are transmitted to and stored in an evaluation unit, and a continuous evaluation of the summed measured values can be carried out there for determining the maximum loading capacity.

2. A device for carrying out the method according to Claim 1, wherein strain gauges are used as electric load sensors..

3. The device for performing the method according to Claims 1 or 2, wherein the evaluation unit is connected with a display device for the driver, that indicates when the maximum loading limit of the components is reached.